



PATENT APPLICATION

IN THE U.S. PATENT AND TRADEMARK OFFICE

November 24, 2009

Applicant: Anthony Denis McCORMACK

For: TOBACCO SMOKE FILTER

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Commissioner for Patents
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APPELLANT'S BRIEF ON APPEAL

Sir:

This is an appeal from the decision of the Examiner dated March 23, 2009, finally rejecting Claims 1-16.

REAL PARTY IN INTEREST

Filtrona International, Ltd. is the assignee of the present application and the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences to the present application.

STATUS OF CLAIMS

Claims 1-16 are pending and are the claims under consideration on appeal.

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STATUS OF AMENDMENTS

The Request for Reconsideration filed on July 23, 2009 has been entered by the Examiner. No amendments to the claims after the final rejection have been filed.

SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's invention, as defined by independent Claim 1, is directed to a tobacco smoke filter containing activated carbon which has a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2) and in which carbon mesopores of 2 to 50 nm pore diameter provide a mesopore volume of at least $0.25 \text{ cm}^3/\text{g}$ (N_2) (specification page 2, lines 12-18).

Appellant's invention, as defined by independent Claim 2, is directed to a tobacco smoke filter which contains activated carbon having a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2) (specification page 2, lines 12-16) and in which carbon mesopores of 7 to 50 nm pore diameter provide a mesopore volume of at least $0.12 \text{ cm}^3/\text{g}$ (Hg) (specification page 2, lines 23-25).

Appellant's invention, as defined by independent Claim 16, is directed to a filter which is used in the filtering of tobacco smoke in which the improvement comprises the filter contains activated carbon having a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2) and at least one of mesopores of 2 to 50 nm pore diameter having a mesopore volume of at least $0.25 \text{ cm}^3/\text{g}$ (N_2) and mesopores of 7 to 50 nm pore diameter having a mesopore volume of at least $0.12 \text{ cm}^3/\text{g}$ (Hg), and a flavourant (specification page 2, lines 12-25 and specification page 4, lines 7-10).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The first ground of rejection to be reviewed on appeal is whether Claims 1-4, 6-10 and 15 are unpatentable under 35 USC 103(a) over Bereman in view of Garrido et al. The second ground of rejection to be reviewed on appeal is whether Claim 4 is unpatentable under 35 USC 103(a) over Bereman in view of Garrido et al and further in view of Baur et al. The third ground of rejection to be reviewed on appeal is whether Claims 11-14 and 16 are unpatentable under 35 USC 103(a) over Bereman in view of Garrido et al and further in view of Hershe et al.

ARGUMENT

It is the object of the present invention to provide a tobacco smoke filter which can deliver a satisfactory level of a flavourant while effectively removing vapor phase components from the tobacco smoke. In order for this advantageous combination of properties to be achieved, the present inventors discovered that it was necessary that a tobacco smoke filter contain activated carbon having the claimed micropore relationship. That is, the activated carbon in the present invention has a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2) and at least one of mesopores of 2 to 50 nm pore diameter having a mesopore volume of at least $0.25 \text{ cm}^3/\text{g}$ (N_2) and mesopores of 7 to 50 nm pore diameter having a mesopore volume of at least $0.12 \text{ cm}^3/\text{g}$ (Hg). That is, the present claims require that there be a specific micropore volume provided by micropores of under 2 nm pore diameter and specific mesopore volumes of carbon mesopores of from 2 to 50 nm pore diameter and/or 7 to 50 nm pore diameter. As to the Examiner's statement that the currently presented Claim 1 reads on a zero micropore volume, Appellant respectfully disagrees. It is inherent that activated carbon will have some micropores and mesopores and therefore have volumes associated therewith. The Garrido et al reference cited by the Examiner supports

this position. If the Examiner disputes this position, he is requested to provide some authority.

REJECTION OF CLAIMS 1-4, 6-10 AND 15
UNDER 35 USC 103(a) AS BEING UNPATENTABLE
OVER BEREMAN IN VIEW OF GARRIDO ET AL

The Bereman reference is directed to a method and product for the removal of carcinogens from tobacco smoke and, in particular, to catalytic systems that contain a metallic catalyst and carbonaceous particles that serve as a support for the catalyst to reduce the content of certain harmful or carcinogenic substrates, such as polyaromatic hydrocarbons, tobacco-specific nitrosamines, carbazol, phenol and catechol, in both mainstream and sidestream cigarette smoke. The carbonaceous particles in this reference serve as a support for the catalyst so there is no disclosure with respect to any benefit being obtained through the control of the pore size of the carbon. This reference states that activated carbon can be used and that activated carbon can be used derived from wood, coconut shells, coal and peat and further discloses that wood produces soft and macroporous activated carbon having pores from 50 to 1,000 nm in diameter, peat and coal generally produce activated carbon that is predominantly mesoporous and has a pore diameter of from 2 to 50 nm and that coconut shells produce an activated carbon that is generally microporous having pores of less than 2 nm in diameter. Microporous activated carbons are disclosed as being preferred, which is consistent with the disclosure in the present specification which indicates that a micropore volume is needed for volatile phase removal performance. However, there is no suggestion in this reference that anything advantageous would be gained by the presently claimed micropore and mesopore structure.

The Garrido et al reference is a paper directed to the effect of gasification by air or carbon dioxide in the development of microporosity in activated carbon and the resulting effects. The series D reaction described on page

1083 of this reference adapts microporosity but does not adapt mesoporosity or macroporosity. The series B experiment on the same page discloses that there is an increase in the contribution of meso- and macro- porosity following a reaction in air, although this appears to be because of a reduction in the contribution of microporosity. Therefore, Garrido et al emphasizes the reaction to adapt the macroporosity in the activated carbon. There is no suggestion in Garrido et al with respect to activated carbon being used for the filtration of tobacco smoke or that the pore structure required by the present claims would provide an activated carbon with the unexpected benefit of both adequate flavourant release and absorption of vapor phase components from tobacco smoke.

The Bereman disclosure emphasizes the importance of microporosity while the Garrido et al reference only teaches how this may be adapted. As such, combining these references would in no way disclose to one of ordinary skill in the art how to prepare an activated carbon having a specified microporosity and mesoporosity and the effects associated therewith. The combination of these references would not hint that the adaptation of the porosity of carbon would give an activated carbon which, when used in the specific application of smoke filtration, provides both a satisfactory level of absorption of flavourant, releases sufficient flavourant to deliver a satisfactory taste and shows a good absorption of vapor phase components from tobacco smoke. This is clearly unexpected in light of the prior art cited by the Examiner and, as such, it is respectfully submitted that a showing of prima facie obviousness under 35 USC 103(a) is not made by these references.

Although Bereman in combination with Garrido et al does not make a proper showing of prima facie obviousness under 35 USC 103 with respect to Claims 1-4, 6-10 and 15, objective evidence is of record in the present application which is more than sufficient to rebut any proper showing of prima facie obviousness. On pages 5-9 of the present specification,

Examples B, C, D and H all utilize activated carbon according to the present invention while Comparative Example A uses a coconut-based carbon as is typically used in prior art cigarette filters and Comparative Examples E-G and I-M use carbons having a pore structure outside of the scope of the present claims but closer to the presently claimed invention than the prior art cited by the Examiner. The results presented in the Table on pages 8 and 9 of the present specification show that the activated carbon according to the present invention provided both the effective removal of vapor phase components from tobacco smoke and had an improved release of the flavourant as compared with the comparative carbons. This is clearly unexpected in light of Bereman in combination with Garrido et al and further establishes the patentability of Claims 1-4, 6-10 and 15 thereover.

REJECTION OF CLAIM 4 UNDER 35 USC 103(a)
OVER BEREMAN IN VIEW OF GARRIDO ET AL
AND FURTHER IN VIEW OF BAUR ET AL

The discussion above with respect to Bereman being combined with Garrido et al is hereby incorporated with respect to this rejection. The Baur et al reference discloses a process for the catalytic hydrogenation of carbocyclic compounds having olefinic double bonds. The Examiner has cited this reference as disclosing macroporous activated carbon having a surface area of from about 1-8 m²/g. However, the utilities disclosed in this reference for the macroporous activated carbon is completely different from that of the present invention in that the activated carbon is used as a carrier for a catalyst in a catalytic hydrogenation reaction of carbocyclic compounds having olefinic linkages. Nothing in this reference suggests a combination with Garrido et al and Bereman. Therefore, these references do not even present a showing of prima facie obviousness under 35 USC 103(a). Furthermore, as explained above, given the showings of unobviousness present in the instant specification with

respect to the unexpectedly superior results achieved by the activated carbon filter of the present invention as compared with comparative carbons, the patentability of Claim 4 over the combination of Baur et al with Garrido et al and Bereman is further established.

REJECTION OF CLAIMS 11-14 AND 16

UNDER 35 USC 103(a) OVER BEREMAN IN VIEW OF GARRIDO ET AL
AND FURTHER IN VIEW OF HERSHE

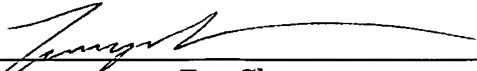
The discussion above with respect to the combination of Bereman and Garrido et al is hereby incorporated for this rejection. Hershe et al discloses a composition comprising L-glutathione and a source of selenium for inclusion within a cigarette, cigar or pipe. This reference has been cited by the Examiner as disclosing the use of a menthol flavor in a cigarette filter. However, there is no suggestion in this reference that an activated carbon contained in a filter used in filtering tobacco smoke could both absorb vapor phase components containing tobacco smoke and still adequately release a flavourant if they possessed the claimed porosity. Therefore, this reference in combination with Garrido et al and Bereman do not even present a showing of prima facie obviousness under USC 103(a). Furthermore, given the evidence of unobviousness contained in the present specification discussed above by the Examples and Comparative Examples, objective evidence is of record which is more than sufficient to rebut any proper showing of prima facie obviousness under 35 USC 103(a). As such, Appellants respectfully submit that the presently claimed invention is patentably distinguishable over Hershe et al in combination with Garrido et al and Bereman.

CONCLUSION

For the reasons advanced above, it is respectfully submitted that the currently presented claims are patentably

distinguishable over the prior art cited by the Examiner.
Reversal of the Examiner is respectfully solicited.

Respectfully submitted,


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Encl: Claims Appendix
Evidence Appendix
Related Proceedings Appendix
Postal Card

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CLAIMS APPENDIX

1. A tobacco smoke filter containing activated carbon which has a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2), and in which carbon mesopores of 2 to 50 nm pore diameter provide a mesopore volume of at least $0.25 \text{ cm}^3/\text{g}$ (N_2).

2. A tobacco smoke filter containing activated carbon which has a micropore volume provided by micropores of under 2 nm pore diameter, said micropore volume being at most $0.3 \text{ cm}^3/\text{g}$ (N_2), and in which carbon mesopores of 7 to 50 nm pore diameter provide a mesopore volume of at least $0.12 \text{ cm}^3/\text{g}$ (Hg).

3. A tobacco smoke filter according to claim 1 wherein at least $0.12 \text{ cm}^3/\text{g}$ (Hg) of said mesopore volume is provided by mesopores of 7 to 50 nm pore diameter.

4. A filter according to claim 1 wherein macropores of over 50 nm diameter provide a surface area of at least $5 \text{ m}^2/\text{g}$ (Hg).

5. A filter according to claim 1 wherein said micropore volume is at most $0.26 \text{ cm}^3/\text{g}$ (N_2).

6. A filter according to claim 1 wherein said micropore volume is at most $0.15 \text{ cm}^3/\text{g}$ (N_2).

7. A filter according to claim 1 wherein said 2 to 50 nm mesopore volume is about $0.3 \text{ cm}^3/\text{g}$ (N_2).

8. A filter according to claim 1 wherein said 2 to 50 nm mesopore volume is over 0.4 or over $0.5 \text{ cm}^3/\text{g}$ (N_2).

9. A filter according to claim 2 wherein said 7 to 50 nm mesopore volume is at least $0.13 \text{ cm}^3/\text{g}$ (Hg).

10. A filter according to claim 2 wherein said 7 to 50 nm mesopore volume is over $0.3 \text{ cm}^3/\text{g}$ (Hg).

11. A filter cigarette containing volatile flavourant and a filter according to claim 1.

12. A filter cigarette according to claim 11 wherein said flavourant comprises menthol.

13. A filter cigarette according to claim 11 wherein said flavourant is applied to said activated carbon.

14. A filter cigarette according to claim 11 wherein said flavourant is applied to a part of said filter or cigarette other than said activated carbon and/or to packaging for said cigarette.

15. A filter according to claim 2, wherein said 7 to 50 nm mesopore volume is over $0.5 \text{ cm}^3/\text{g}$ (Hg).

16. In a filter which is used in the filtering of tobacco smoke, the improvement comprising said filter containing activated carbon which has a micropore volume provided by micropores of under 2 nm pore diameter of at most $0.3 \text{ cm}^3/\text{g}$ (N_2) and at least one of mesopores of 2 to 50 nm pore diameter having a mesopore volume of at least $0.25 \text{ cm}^3/\text{g}$ (N_2) and mesopores of 7 to 50 nm pore diameter having a mesopore volume of at least $0.12 \text{ cm}^3/\text{g}$ (Hg), and a flavourant.

EVIDENCE APPENDIX

There is no extrinsic evidence being relied on by Appellant.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings.